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10/019,615	05/28/2002	Ravi Chandran	12785US01	7963

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34th Floor
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EXAMINER

WOZNIAK, JAMES S

ART UNIT	PAPER NUMBER
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2626

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/05/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/019,615

Applicant(s)

CHANDRAN ET AL.

Examiner

James S. Wozniak

Art Unit

2626

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 November 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 and 28-61 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-26 and 28-61 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 May 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. In response to the office action from 6/8/2006, the applicant has submitted an amendment, filed 11/8/2006, amending claims 1, 26, and 57, while arguing to traverse the art rejection based on the amended limitations (*Amendment, Pages 21-22*). The applicant's arguments have been fully considered but are moot with respect to the new grounds of rejection, necessitated by the amended claims, and further in view of Chen (*U.S. Patent: 5,651,091*).
2. Due to the amendment of Claims 26 and 27, the examiner has withdrawn the previous objection directed towards minor informalities.
3. Due to the amendment of Claims 1 and 57, the examiner has withdrawn the previous 35 U.S.C. 112, first paragraph rejection directed towards single means claims.

Response to Arguments

4. In response to the applicants' arguments that amended claim 57 overcomes the 35 U.S.C. 101 rejection (*Amendment, Page 21*), the examiner notes that controlling the echo characteristic of a compressed digitized audio signal still constitutes non-statutory subject matter because the claim is still directed to abstract digital data (*0's and 1's*) and not a tangible audio output. In

other words, the final result must be useful, tangible, and concrete, whereas manipulated digital bits are still abstract (*see Interim Guidelines for examination of Patent Applications for Patent Subject Matter Eligibility, Pages 37-39*). Thus, the 35 U.S.C. 101 rejection of Claims 57-61 is maintained.

Claim Rejections - 35 USC § 101

5. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

6. **Claims 57-61** are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

As per the MPEP (2106 [R-3], IV):

In practical terms, claims define nonstatutory processes if they:

- consist solely of mathematical operations without some claimed practical application (i.e., executing a “mathematical algorithm”); or
- simply manipulate abstract ideas, e.g., a bid (*Schrader*, 22 F.3d at 293-94, 30 USPQ2d at 1458-59) or a bubble hierarchy (*Warmerdam*, 33 F.3d at 1360, 31 USPQ2d at 1759), without some claimed practical application.

In the particular case of Claim 57, the claimed subject matter is directed towards a method comprising “adjusting first bits and second bits,” which is merely a manipulation of abstract data in a processing device that does not, in itself, produce a useful, concrete, and tangible result.

Dependent claims 58-61 do not remedy the non-statutory subject matter issue noted above with respect to claim 57, and therefore, are also rejected under 35 U.S.C. 101, as being directed towards non-statutory subject matter.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. **Claims 1-26 and 28-31** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1 and 26 are directed to an *apparatus* for reducing echo comprising first and second transmitter handsets using a compression code and a processor responsive to transmitted signals to reduce an echo. Based on the current claim language, it is uncertain whether the applicant is claiming the system shown in Fig. 9 or simply the network coded domain echo control (CDEC) device (Element 40) because the preamble refers to the echo reducing apparatus, but the body of the claim refers to the overall system shown in Fig. 9 (*i.e., the originating transmitters are located in the handsets*). The examiner has interpreted claims 1 and 26 as corresponding to the system shown in Fig. 9 for the application of the prior art of record. If the applicant desires to claim only the CDEC apparatus (Element 40), the examiner recommends claiming the partial decoders that receive transmitted coded audio signals from the first and second handsets. Amendment to either the system in place of the apparatus or the apparatus

featuring the partial decoders receiving transmitted coded audio signals from the first and second handsets is recommended to overcome this rejection.

Dependent claims 2-25 and 28-31 fail to overcome the 35 U.S.C. 112, second paragraph rejection directed towards claims 1 and 26, and thus are also indefinite.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. **Claims 1-4, 7-12, 15-16, 18-26, 32-35, 38-43, 46-47, and 49-57** are rejected under 35 U.S.C. 103(a) as being unpatentable over Rabipour et al (*U.S. Patent: 6,011,846*) in view of Chen (*U.S. Patent: 5,651,091*).

With respect to **Claims 1 and 32**, Rabipour discloses:

A first handset generating a near end signal using a compression code comprising a plurality of parameters including a first parameter (*near end encoded speech signals received over a telecommunications or cellular communications network, Col. 3, Line 33- Col. 4, Line 22; Col. 1, Lines 15-40, which would inherently require handset devices to enable speech communication between users*), wherein the parameters represent an audio signal comprising a plurality of audio characteristics (*LPC parameters, Col. 3, Lines 48-54; and Col. 6, Lines 20-31*),

wherein the compression code is decodable by a plurality of decoding steps (*decodable LPC parameters, Col. 1, Lines 33-40; and partial decoding steps, Col. 1, Line 52- Col. 3, Line 10*);

A second handset generating a far end digital signal using a compression code (*far end encoded speech signals received over a telecommunications or cellular communications network, Col. 3, Line 33- Col. 4, Line 22; Col. 1, Lines 15-40, which would inherently require handset devices to enable speech communication between users*); and

A processor responsive to the near end digital signal to read at least said first parameter of said plurality of parameters, to perform at least one of said plurality of decoding steps on the near end digital signal and the far end digital signal to generate at least partially decoded near end signals and at least partially decoded far end signals (*extracting speech parameters from near and far end encoded speech signals, Col. 3, Line 48- Col. 4, Line 22*), wherein said processor estimates an echo likelihood based on partially decoded near and far end frames (*echo compensation adaptive to an echo presence certainty, Col. 4, Line 55- Col. 6, Line 16*), Wherein said processor, when the estimation of echo likelihood indicates an echo is responsive to said at least partially decoded near end signals and at least partially decoded far end signals to adjust the first parameter to generate an adjusted first parameter and to replace said first parameter with the adjusted first parameter in the near end digital signal (*adjusting near end speech parameters in response to an echo presence certainty, Col. 5, Line 35- Col. 6, Line 16*).

Although Rabipour teaches the same echo compensation process and system recited in the presently claimed invention, Rabipour does not specifically suggest that processing takes place on a subframe level, however such alternative subframe-based speech processing is well known in the speech coding art as is evidenced by Chen (*Col. 5, Lines 5-8*).

Rabipour and Chen are analogous art because they are from a similar field of endeavor in speech coding. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Rabipour with the subframe-based speech processing taught by Chen in order to provide a convenient frame format for processing speech parameters in a well-known CELP coding format (*Chen, Col. 4, Line 58- Col. 5, Line 4*).

With respect to **Claims 2 and 33**, Rabipour discloses:

The first parameter is a quantized first parameter and wherein said processor generates said adjusted first parameter in part by quantizing said adjusted first parameter before writing said adjusted first parameter into said near end digital signal (*replacing speech parameters with adjusted speech parameters after quantization, Col. 6, Line 40- Col. 7, Line 32*).

With respect to **Claims 3 and 34**, Rabipour discloses:

The processor is responsive to the at least partially decoded near end signals and the at least partially decoded far end signals to generate an echo likelihood signal representing the amount of echo present in the partially decoded near end signals, and wherein the processor is responsive to the echo likelihood signal to adjust the first parameter (*Echo compensation adaptive to an echo presence certainty, Col. 5, Line 35- Col. 6, Line 16*).

With respect to **Claims 4 and 35**, Rabipour recites:

Characteristics comprise spectral shape (*near and far end spectrum, Col. 3, Line 48- Col. 4, Line 22*) and wherein said first parameter comprises a representation of filter coefficients (*LPC coefficients including excitation parameters, Col. 6, Lines 20-31*), and wherein said processor is responsive to said echo likelihood signal to adjust said representation of filter

coefficients towards a magnitude frequency response (*modifying LPC coefficients based on a modified impulse response, Col. 6, Line 20- Col. 7, Line 32*).

With respect to **Claims 7 and 38**, Rabipour recites:

The magnitude frequency response corresponds to background noise (*correction factor determined using an impulse response for updated LPC parameters corresponding to background noise, Col. 7, Lines 11-62*).

With respect to **Claims 8-9 and 39-40**, Rabipour also discloses LPC coefficients related to an energy level (*Col. 5, Line 45- Col. 6, Line 16*), while Chen recites gain codevectors (*Col. 20, Lines 55-65*).

With respect to **Claims 10 and 41**, Chen further discloses the use of long-term predictor and pitch period parameters (*Col. 4, Lines 3-44*).

With respect to **Claims 11 and 42**, Chen further recites the use of a long-term pitch predictor and an associated pitch gain (*Col. 3, Lines 14-25*).

Claims 12 and 43 contains subject matter similar to Claims 4 and 35, and thus, is rejected for similar reasons.

With respect to **Claim 15**, Rabipour discloses LPC coefficients including excitation parameters (*Col. 6, Lines 20-31*).

With respect to **Claims 16 and 47**, Rabipour discloses partial decoding for extracting speech parameters, which avoids synthesis processing (*Col. 1, Line 52- Col. 3, Line 10*).

With respect to **Claim 18**, Rabipour discloses:

The at least one decoding step comprises post filtering (*synthesis processing of a coded speech signal that would inherently include filtering, Col. 1, Line 52- Col. 3, Line 10*).

With respect to **Claims 19 and 50**, Rabipour discloses the use of LPC-based speech compression (*Col. 1, Lines 48-51*).

With respect to **Claims 20 and 51**, Chen discloses the long-term predictor coding as applied to Claim 11.

With respect to **Claims 21 and 52**, Rabipour discloses the use of CELP compression (*Col. 8, Lines 8-11*).

With respect to **Claims 22 and 53**, Rabipour discloses averaging a set of near and far end LPC parameters to determine a degree of echo compensation (*Col. 3, Line 48- Col. 4, Line 22*).

With respect to **Claims 23 and 54**, Rabipour teaches the frame-based echo suppression system and method that adjusts speech parameters according to a detected echo, as applied to Claim 1, while Chen recites subframe-based processing (*Col. 5, Lines 5-8*).

With respect to **Claims 24 and 55**, Rabipour teaches completing echo suppression for a frame before advancing to a next frame as shown in Figs. 2C and 3, while Chen discloses the subframe based processing as applied to Claim 23.

With respect to **Claims 25 and 56**, Rabipour teaches the frame-based echo suppression system and method that adjusts speech parameters for each speech frame according to a detected echo, as applied to Claim 1, while Chen recites subframe-based processing (*Col. 5, Lines 5-8*).

With respect to **Claims 26 and 57**, Rabipour teaches the method and system recited in claims 1 and 32 and further discloses:

A processor responsive to the near end digital signal and the far end digital signal to adjust the first and second bits (*LPC compressed speech data bit stream adjusted based on near*

and far end speech data, Col. 3, Lines 1-10; Col. 3, Line 48- Col. 4, Line 22; Col. 5, Line 35- Col. 7, Line 32).

With respect to **Claim 46**, Rabipour further discloses LPC coefficients including excitation parameters (*Col. 6, Lines 20-31*).

With respect to **Claim 49**, Rabipour further discloses:

The at least one decoding step comprises post filtering (*synthesis processing of a coded speech signal that would inherently include filtering, Col. 1, Line 52- Col. 3, Line 10*).

11. **Claims 5-6, 13-14, 36-37, and 44-45** are rejected under 35 U.S.C. 103(a) as being unpatentable over Rabipour et al in view of Chen and further in view of Strawczynski et al (*U.S. Patent: 6,138,022*).

With respect to **Claims 5, 14, 36, and 45**, Rabipour in view of Chen discloses the echo suppression system and method utilizing LPC coefficients, as applied to Claims 1 and 12. Rabipour in view of Chen does not teach the use of line spectral frequencies (*LSFs*), however Strawczynski teaches the use of such LSF coefficients (*Col. 3, Lines 24-34*).

Rabipour, Chen, and Strawczynski are analogous art because they are from a similar field of endeavor in speech coding systems. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Rabipour in view of Chen with the LSF coefficients taught by Strawczynski in order to provide speech coefficients that uniquely define a human articulatory tract, which are suited to a number of different applications (*Strawczynski, Col. 3, Lines 24-34*).

With respect to **Claims 6, 13, 37, and 44**, Strawczynski additionally recites the use of log area ratio coefficients (*Col. 3, Lines 24-34*).

12. **Claims 17 and 48** are rejected under 35 U.S.C. 103(a) as being unpatentable over Rabipour et al in view of Chen and further in view of Christensson et al (*U.S. Patent: 6,510,224*).

With respect to **Claims 17 and 48**, Rabipour in view of Chen discloses the echo suppression system and method utilizing spectrum coefficients, as applied to Claims 1 and 12. Rabipour in view of Chen does not specifically suggest the use of power parameters, however Christensson teaches the use of such parameters (*Col. 6, Line 40- Col. 7, Line 8*).

Rabipour, Chen, and Christensson are analogous art because they are from a similar field of endeavor in speech coding systems. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Rabipour in view of Chen with the use of power parameters in echo suppression as taught by Christensson in order to achieve improved echo suppression performance based on a power parameter and focused on frequency bands where an echo component could easily be mistaken for near end speech (*Christensson, Col. 7, Lines 1-8*).

13. **Claims 28-31 and 58-61** are rejected under 35 U.S.C. 103(a) as being unpatentable over Rabipour et al in view of Chen and further in view of Navaro et al (*U.S. Patent: 6,108,560*).

With respect to **Claims 28 and 58**, Rabipour in view of Chen discloses the system for adapting speech parameters as applied to Claim 26. Rabipour in view of Chen does not teach the

use of the PCM coding standard, however Navaro discloses the use of such a standard in a TFO GSM environment (*Col. 6, Lines 11-29*).

Rabipour and Navaro are analogous art because they are from a similar field of endeavor in speech coding systems. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Rabipour with the PCM coding implementation in a GSM system as taught by Navaro in order to achieve high quality speech coding in a mobile environment (*Navaro, Col. 1, Line 11- Col. 2, Line 11*).

With respect to **Claims 29 and 59**, Navaro further teaches speech coding implemented in such an environment (*Col. 6, Lines 11-29*).

With respect to **Claims 30-31 and 60-61**, Rabipour teaches adjusting speech parameters as applied to Claim 26, while Navaro further recites the TFO frame format comprising 2 LSBs and 6 MSBs of PCM speech data (*Col. 6, Lines 11-29*).

Conclusion

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Lee et al (*U.S. Patent: 6,577,606*)- discloses subframe-based processing in an echo canceller.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to James S. Wozniak whose telephone number is (571) 272-7632. The examiner can normally be reached on M-Th, 7:30-5:00, F, 7:30-4, Off Alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Hudspeth can be reached at (571) 272-7843. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

James S. Wozniak
1/24/2007



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